

Application No. 10/534,956
Paper Dated: March 21, 2011
In Reply to USPTO Correspondence of January 19, 2011
Attorney Docket No. GTR206-0002 US

Amendments to the Claims

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

Claims 1-23. (Cancelled)

Claim 24 (Currently Amended): A method for producing a micro electro-mechanical device package, comprising the steps of:

forming a thermally decomposable photodefinable sacrificial layer on a substrate of a micro electro-mechanical device, the sacrificial layer encapsulating a portion of the micro electro-mechanical device;

image-wise exposing said photodefinable sacrificial layer where said layer is patterned;

forming an contiguous overcoat layer around the sacrificial layer; and

thermally decomposing the sacrificial layer where~~in~~ decomposed molecules of the sacrificial layer permeate through the contiguous overcoat layer, and where~~in~~ a gas cavity is formed where the thermally decomposable sacrificial layer was formed,

where~~in~~ the overcoat layer provides an airtight enclosure around the gas cavity.

Claim 25 (Original): The method of claim 24, further comprising the steps of:

depositing the sacrificial layer by spin-coating; and
patterning the sacrificial layer.

Claim 26 (Currently Amended): The method of claim 24, where~~in~~ the sacrificial layer has a decomposition temperature less than a

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decomposition temperature of the substrate and a decomposition temperature of the overcoat layer.

Claim 27 (Currently Amended): The method of claim 24, wherein the substrate comprises a silicon material.

Claim 28 (Currently Amended): The method of claim 24, wherein the substrate comprises a non-silicon material.

Claim 29 (Currently Amended): The method of claim 24, wherein the thickness of the overcoat layer is within the range of 50 nm and 500 μ m.

Claim 30 (Currently Amended): The method of claim 24, wherein the overcoat layer has not been perforated.

Claim 31 (Currently Amended): The method of claim 24, wherein the overcoat layer is substantially free of the sacrificial layer after the sacrificial layer has been thermally decomposed.

Claim 32 (Cancelled)

Claim 33 (Currently Amended): The method of claim ~~[[32]]~~24, wherein the overcoat layer provides protection from mechanical forces.

Claim 34 (Currently Amended): The method of claim 33, wherein the overcoat layer further provides protection against water.

Claim 35 (Currently Amended): The method of claim 34, wherein the overcoat layer further provides protection against oxygen gas.

Claim 36 (Currently Amended): The method of claim 34, wherein the overcoat layer further provides protection against exposure to gaseous materials.

Claim 37 (Currently Amended): The method of claim 24, wherein the micro electro-mechanical device includes a released mechanical structure before the sacrificial layer is formed.

Claim 38 (Currently Amended): The method of claim 24, further comprising the steps of:

before the overcoat layer is formed, attaching the micro electro-mechanical device to a metal packaging frame, wherein the overcoat layer comprises an epoxy resin encapsulating the micro electro-mechanical device and metal packaging frame assembly.

Claim 39 (Previously Presented): The method of claim 38, further comprising the step of:

heating the micro assembly at a temperature for curing the overcoat layer; and

heating the micro assembly at a temperature for decomposing the sacrificial layer, the temperature for decomposing the sacrificial layer exceeding the temperature for curing the overcoat layer.

Claim 40 (Previously Presented): The method of claim 24, further comprising the step of:

forming a barrier layer around the overcoat layer, the barrier layer providing a stronger protection against mechanical forces than the overcoat layer.

Claim 41 (Currently Amended): The method of claim 40, wherein the barrier layer comprises a metal material.

Claim 42 (Previously Presented): The method of claim 40, further comprising the steps of:

creating a vacuum inside the gas cavity by heating the micro electro-mechanical device in a chamber; and

after the vacuum is created, forming a barrier layer around the overcoat layer within the chamber to provide a vacuum-packed enclosure around the gas cavity, the barrier layer comprising a metal material.

Claim 43 (Previously Presented): The method of claim 42, further comprising the steps of:

after the barrier layer is formed, attaching the micro electro-mechanical device to an integrated circuit package structure; and

encapsulating the electro-mechanical device and integrated circuit package structure in a surrounding structure.

Claim 44 (Currently Amended): The method of claim 42, wherein the integrated circuit package structure comprises a leadframe.

Claim 45 (Currently Amended): The method of claim 42, wherein the integrated circuit package structure comprises a ceramic package.

Claim 46 (Currently Amended): The method of claim 42, wherein the step of thermally decomposing the sacrificial layer occurs inside the vacuum chamber.

Claim 47 (Previously Presented): The method of claim 24, further comprising the steps of:

after the sacrificial layer is decomposed, attaching the micro electro-mechanical device to an integrated circuit package structure; and

encapsulating the electro-mechanical device and package structure in a surrounding structure.

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Claim 48 (Currently Amended): The method of claim 47,
wherein the integrated circuit package structure comprises a leadframe.

Claim 49 (Currently Amended): The method of claim 47,
wherein the integrated circuit package structure comprises a ceramic
package.

Claim 50 (Currently Amended): The method of claim 24,
wherein thermal decomposition temperature of the sacrificial layer is less
than 100 degrees Celsius.

Claim 51 (Cancelled)

Claim 52 (Currently Amended): The method of Claim 24,
wherein said gas cavity is formed while decomposed molecules produced by
decomposition of the sacrificial layer permeate the overcoat layer.

Claim 53 (Currently Amended): The method of Claim 24,
wherein said overcoat layer comprises a polymer.

Claim 54 (Currently Amended) The method of Claim 24,
wherein said overcoat layer comprises a photodefinable polymer.

Claim 55 (Currently Amended): The method of Claim 24,
wherein said overcoat layer is a solid overcoat layer.